1930

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Vol. 32, No. 9 Bartow, Florida September, 1951

CITRUS INDUSTRY BUYER'S GUIDE

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Citrus Insect Control For September 1951

R. M. PRATT & W. L. THOMPSON*
FLORIDA CITRUS EXPERIMENT STATION, LAKE ALFRED

Purple and Florida red scale populations have, on an average, declined during the past month but in some groves the infestations have increased. Where scale increases are apparent, control measures should be taken since there is still a period of over two months of weather favorable for scale development. During the first half of September there should be a fairly high percentage of purple and red scale in the first, second and early third stages.

Rust mite infestations have continued to increase and may be expected to do so for the next several weeks.

Spray Programs

Where no scalicide has been applied this year or where the scales are too numerous following the spring or summer scalicide application, an opportune time for treatment will be during the first half of September. Use parathion at 1 pound to 1 2/3 pounds per 100 gallons and add wettable sulfur at a concentration of 5 pounds if there is a light infestation of rust mites or 8 pounds if there is a heavy infestation. Oil emulsions can be used but an application made at this time of year is likely to prevent the formation of maximum solids in the juice of the fruit and retard degreening of early and mid-season varieties. If an oil spray was applied during the summer it is especially desirable to use parathion for the second scalicide spray because two oil sprays will affect the solids and degreening to a greater degree than one application.

Rust Mites

Since rust mites are still increasing, a close inspection should be made for rust mite infestations. During rainy weather the sulfur is soon washed off the fruit and foliage and re-infestation may occur sooner than expected. Inspect inside as well as outside fruit. Use wettable sulfur at 10 pounds per 100 gallons or apply a sulfur dust on two sides of the trees. Sunburned fruit is now common in many groves so lime-sulfur sprays should be avoided because they are more toxic than wettable sulfur or sulfur dust. In no case should lime-sulfur be applied to Hamlins, Jaffas or tangerines at this time of the year. Thorough applications of either sulfur sprays or dusts are necessary during the late summer and fall period because the weight of the fruit has compacted the foliage. This compaction tends to prevent the penetration of the spray or dust through the trees.

Purple Mites

Purple mites may be numerous enough in a few groves to warrant treatment. If it is necessary to spray, use Neotran at 2 pounds per 100 gallons. If the temperature is not above 90°, DN 111 at 1¼ pounds per 100 gallons may be used. Wettable sulfur should be added to either spray. If there is a light infestation, use wettable sulfur at 5 pounds per 100 gallons; for a heavy infestation use 8 pounds.

For more specific information consult the Florida Citrus Experiment Station at Lake Alfred or Fort Pierce.

*Written August 22, 1951. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; J. B. Weeks, Avon Park; and E. D. Harris, Jr., Lake Alfred.

EARLY FLORIDA HISTORY TOLD IN 'FLORIDA AFLAME'

Under the title of "Florida Aflame", the Florida Park Service, Tallahassee, is distributing a reprint of a paper, appearing in the Florida Historical Quarterly, by Mark F. Boyd, describing the background of, and the onset of the Seminole War, occurring in December, 1835.

It discusses the destruction of the sugar industry on the upper East Coast, the murders at Fort King, the ambush of Major Dade's command, and the first battle of the Withlacoochee.

Although the places, where these events happened, were widely separated in the territory, their nearly simultaneous occurrence rocked Florida as has no other event before or since.

The confidence of Florida citrus growers in the future of the industry is graphically reflected by the picture shown on the cover of this magazine, which is a part of a 300-acre tract of new planting from 1 to 3 years of age. The photo taken by a Citrus Industry photographer is just north of Haines City and is only a small part of the thousands of acres of new groves to be seen between Haines City and Leesburg on the new highway No. 25

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Railroad Rates To Be Increased Effective Oct. 1

By GORDON STEDMAN,
Secretary-Manager, Growers and
Shippers League of Florida

The Interstate Commerce Commission released its decision August second, and authorized the railroads to increase their rates and charges 9% within Eastern territory, 6% within Southern territory, 6% within Western teritory, and 6% interterritorially between the three territories, observing 6 cents per cwt. as maximum on fresh fruits and vegetables and canned goods, but did not authorize a maximum increase on frozen citrus concentrate.

The carriers were also authorized to increase their charges for diversion or reconsignment, stopping in transit, terminal services, such as storage, handling, trimming, floatage, lighterage, loading and unloading, except that no increase is permitted for unloading fresh fruits and vegetables at New York and Philadelphia, no increase is permitted on protective service charges, and no increase is authorized in demurrage charges.

The increased rates and charges authorized may become effective not later than October 1, 1951, upon fifteen days notice, and authority to maintain the increases as a result of these findings shall expire February 28, 1953, unless sooner modified or terminated.

The carriers requested in their petition authority to increase their rates 15%, observing 15 cents per cwt. maximum on fresh fruits and vegetables, but did not ask that a hold-down or maximum apply on canned goods or frozen citrus concentrate.

The League's attorney, Mr. M. W. Wells, can be given almost exclusive credit with respect to the Commission's denial of an increase in protective service charges and in commenting on the carriers' request for a 15% increase in protective service charges the Commission followed nearly word for word the argument Mr. Wells used in opposing this increase.

The 6% authorized from the South is substantially less than the 15% requested by the carriers and the League's participation opposing the increase has been well justified and our efforts now are being directed toward reducing our rates into the Southwest and Western Trunk Line territories.

In conferring with the Chairman of our Frozen Citrus Concentrate Transportation Advisory Committee, of the Florida Canners' Association, it was determined that we should immediately request a conference with officials of the Florida origin lines in an effort to have them again lower the rates on frozen citrus juice if they expect to participate in the transportation of this commodity.

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Results Shown By Production Records On Irrigated & Nonirrigated Groves

By Zach Savage
ASSO. AGRICULTURAL ECONOMIST
AGRICULTURAL EXP. STATION
AT CITRUS GROWERS INSTITUTE
CAMP McQUARRIE

Since 1931 a number of Florida citrus growers have been cooperating with the Agricultural Extension Service in a study of production costs and returns. The groves included were scattered over the citrus producing area with 85 percent of them in Lake, Orange, Polk, and Highlands counties. The only requirement for including a grove in the study was a willing cooperator who would keep and supply a copy of his grove record.

It is not presumed that these data nor this paper will supply the conclusive and final answer of grove irrigation for the individual grove. Each grove or grove unit has its own individuality and the requirements of each one should be studied for highest efficiency as to irrigation as well as other management factors. This report is given for the purpose of cautioning growers about spending unnecessary amounts for irrigation and to get each grower who irrigates to test out each grove in order to determine whether irrigation pays and to what extent on the particular grove in question.

These data are presented on the basis of averages of irrigated and nonirrigated groves. There are no data as to what the results on these irrigated groves would have been had they not been irrigated. No attempt was made to set up a rigid standard requiring definite procedure or quantity of water added for the grove to be classified as an irrigated grove. Each cooperator gave the information as to whether he practiced irrigation on the grove or not. If the grove was irrigated it was placed in the irrigated group. After once being classified as irrigated, the grove remained in that classification each season until irrigation was no longer a part of the management program.

When To Irrigate

When to irrigate is a very important consideration and should be studied more by research agencies and by individual growers. These data involved decisions by operators who varied widely as to when a grove should be irrigated. Also, there are other factors affecting the exact time the operation actually begins, such as, availability of labor, availability of equipment, other pressing operations, etc. It might well be true that the average grower did not irrigate when he should for best results, nor applied the optimum amount of water needed.

Groves To Irrigate

An editorial in the August 1951 issue of The California Citrograph says there are now and always have been 3 classes of groves: (1) those which pay a profit regularly, (2) those which could be in the profit earning class if they were managed better, and (3) those that cannot be made to pay. I do not know that we have many Class 3 groves in Florida. At any rate there would be no point in irrigating this Class. If they cannot be made to pay, irrigation would run them deeper in the red. If irrigation would qualify as better management for Class 2 groves, it might be practiced on them.

Irrigation might be practiced on Class 1 groves over a long period of time without really determining whether it was paying or not. Most of this Class would pay for a reasonable amount of irrigation and still show a profit except in seasons of low fruit prices. But there is no justification for irrigating this group of groves unless by so

(Continued on page 12)

Symposium Of Certification Of Disease-Free Nursery Stock

Psorosis and Other Bud-Transmitted Diseases of Citrus

Part I

By J. F. L. Childs

Bud-Transmitted Diseases of Citrus in Florida From The Standpoint of Control Through Certification of Disease-Free Bud Sources and Nursery Stock, at Citrus Growers Institute, Camp McQuarrie.

THE CITRUS INDUSTRY
SEPTEMBER ISSUE
Part I

The effect of certain bud-transmitted diseases on the health of the citrus tree in relation to their control through bud certification.—J. F. L. Childs, Pathologist, U. S. D. A. station, Orlando, Fla.

Part II

Does the economic importance of the bud-transmitted diseases of citrus justify a certification program?—R. F. Suit, Pathologist, Citrus Experiment Station, Lake Alfred, Florida.

THE CITRUS INDUSTRY
OCTOBER ISSUE
Part III

The viewpoint of a nurseryman on the merits of a certification program. — W. F. Ward, Ward Nurseries, Avon Park, Fla.

Part IV

Certification of disease-free nursery stock from the standpoint of the grower.—W. W. Lawless, Winter Haven, Fla.

Part V

Certification of disease-free nursery stock from the standpoint of the State Plant Board. —A. C. Brown, Plant Commissioner, Florida State Plant Board, Gainesville, Florida.

As you have heard from Mr. Lawrence's introductory remarks, the purpose of this symposium is to present evidence on the nature and importance of certain bud-transmitted diseases of citrus and the methods required to control them. After hearing the evidence you may form your own opinions as to the advisability of setting up a program to foster the propagation of citrus from bud sources tested and found to be free of these diseases. For the purpose of this symposium we will confine our remarks to those diseases known to be in Florida that are susceptible to control through a properly planned and executed certification program. Such diseases are predominantly or exclusively transmitted through buds. Examples that fit this description are psorosis, and the closely related diseases, concave gum, and blind pocket; cachexia, sometimes known as Orlando tangelo disease; and exocortis, or scaly butt disease, as it is known in Australia.

Considered Virus Diseases

These five diseases are regarded by many as virus diseases. Viruses are disease-producing bodies, similar in shape to bacteria but too small to be seen with the ordinary microscope. Most virus diseases have certain characteristics by which they may be recognized. For example, many cause peculiar mottled or speckled patterns on the leaves or on petals (certain of the variegated flowers of camellias and tulips are due to virus disease). Some viruses are transmitted through the seed, but most are not. Many are transmitted by insects but some are not. Some virus diseases are transmitted only by inserting a piece of diseased wood or bark or leaf into a healthy plant. We know a great deal more about psorosis, concave gum, and blind pocket than about cachexia or exocortis for the reason that they have been recognized longer and more research has been done upon them.

Not Transmitted Through Seed

Observations of many seedlings indicate that the five citrus diseases under discussion are not transmitted through the seed. As a result, any seedling can be regarded as free of these diseases at least until it becomes contaminated through contact with infected buds. However, in the case of psorosis, it is possible to contaminate the rootstock through contact of as short a period as 48 hours so that it is not necessary for the bud to live in order to transmit the disease. On the other hand, there is no evidence that these diseases are spread from tree to tree by insects, pruning tools, or cultural operations. Under such conditions control of these diseases should be comparatively simple. Furthermore, control is not dependent upon the breeding of new resistant varieties nor is there the necessity of keeping healthy trees isolated from the diseased.

Why then have these diseases become so widespread? The answer is that these five diseases have been spread far and wide by man. In all fairness, it should be explained that the better nurserymen are aware of the damage caused by psorosis disease but with the means at their disposal they have been unable to distinguish between healthy and diseased trees in the early stages. Although present in Florida for many years, both concave gum disease and blind pocket have largely gone unrecognized due to the obscure nature of their symptoms. Cachexia and exocortis diseases are both so unfamiliar to Florida citrus growers and nurserymen that most are unaware that such diseases exist. To those not trained in the study of plant diseases the problem of distinguishing between the various root and trunk diseases of citrus presents a very confused picture.

I will not attempt at this time to describe all the features that distinguish between the symptoms of psorosis and the various other citrus diseases with which it has been frequently confused. That has been attempted before and I venture to guess that the only clarification that resulted was in the mind of the author. As a result of this confused situation it should be noted that the full-time employment of men especially trained in the work will be necessary in the event that a program of certification is adopted.

(Continued on page 7)

Effects of Psorosis

However, I will describe the damaging effects to citrus trees of psorosis and the other bud-transmitted diseases, and later Dr. Suit will describe the damaging effects on your pocketbook. To begin with, psorosis disease was probably brought to Florida on plants from the Orient where the disease is widely distributed. It was first recognized in Florida in 1896 and later was recognized in California and Texas. The most conspicuous symptom of trees affected with psorosis is the scaling or sloughing-off of the outer layers of bark (Fig. 1). However, the bark symptom may not appear until the tree

Fig. 1. Bark scaling due to Psorosis disease

is 10 to 15 years of age. At the same time that bark scaling begins the wood underneath commences to be impregnated with gum. The result of gum deposits in the bark and wood is to impede and eventually stop the flow of nutrients and water to the branches and foliage beyond that point. Eventually the affected branch dies back to the scaly area. Apparently a citrus tree can live with the psorosis disease without ill effect up to the time the bark scaling and gum impregnation stage of the disease commences. Then the tree begins to go out of production. The scaly bark condition usually makes its appearance when the grove is 10 to 15 years of age, a time when it should be nearing its peak production. Instead the grower begins to lose production on a few trees, and it should be pointed out that every tree that is not paying its way must have its expenses (spraying, fertilization, and cultivation) paid for by a healthy tree. Replacing dead and dying trees with others propagated from psorosis-infected buds merely leads to a repetition of the "remove and replant" cycle.

Show Virus-Like Patterns

Since the discovery in 1933 that psorosis-infected trees may show virus-like patterns in the leaves (Fig. 2) it has been possible to diagnose the presence of this disease in the first flush of growth

Fig. 2. Leaf pattern due to Psorosis

of young trees. Leaf patterns are found only on immature leaves; also they are fleeting and must be looked for at the right place and at the right time if they are to be recognized. Older trees show leaf patterns only under unusual circumstances, as for example after they have been cut back severely or during an unusually vigorous spring flush of growth. Although the recognition of leaf patterns requires considerable training, the resultant diagnosis is very accurate and has become the basis on which has been built the certification of psorosis-free nursery stock in California and Texas.

Bud Transmission

Now let us discuss some other bud-transmitted diseases. As mentioned previously, concave gum disease (Fig 3) and blind pocket disease (Fig. 4) are closely related

Fig. 3. Diamond-shaped depression due to concave gum disease

to psorosis. Both diseases cause the formation of large pits or indentations in the trunk or limbs although they differ somewhat as to the shape of these pits. So far as we know neither disease

Fig. 4. Narrow depressions due to blind pocket disease

kills the tree outright, but both are responsible for some stunting of growth. Concave gum disease is particularly widespread in Dancy tangerines. Some groves of that variety show virtually 100 percent affected trees. Blind pocket seems to be more common on grapefruit and on sweet orange trees. Both diseases show virus-like patterns in the leaves that are virtually indistinguishable from psorosis, hence both diseases would be eliminated along with psorosis in the course of carrying out a certification program.

Orlando Tangelo Disease

The situation with regard to cachexia, or Orlando tangelo disease, is more complex than psorosis, but at this time its economic importance appears to be less serious. Although this disease has undoubtedly been present in Florida for many years, research on its nature and cause was first undertaken in 1944. My experiments show that cachexia is transmitted in Orlando tangelo buds from diseased trees at a very high rate, but trees propagated from healthy Orlando buds were 100 percent healthy. Cachexia causes severe stunting, chlorotic foliage, bark cankers, and even death to the most susceptible varieties of citrus. Early in the work on this disease we found that the inner bark or phloem of many varieties shows a brownish discoloration due to impregnation with gum that is very characteristic and an easy means of diagnosis (Fig. 5). The wood underneath the discolored bark is

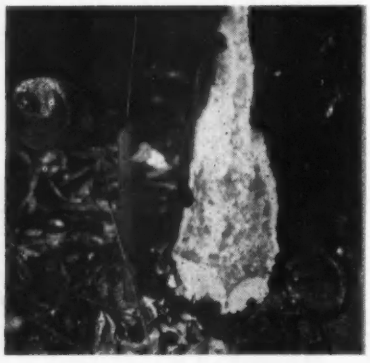

Fig. 5. Discolored inner bark of Cachexia diseased Orlando tangelo

pitted and indented in a characteristic manner, and frequently it too is impregnated with gum. (1).

When the Orlando tangelo or other susceptible variety is grown on Rough lemon, sour orange, or citrange root this bark discoloration and wood pitting is stopped abruptly at the bud union but may extend above the union anywhere from a mere transverse line to 18 inches or more, depending on the age of the tree. On the basis of the symptom of phloem discoloration, our experiments have shown that most of the tangelos are susceptible. A number of the mandarins, including Temple, Clementine, and Ponkan, and also the Nagami kumquat, and several citrus hybrids show this bark discoloration symptom of susceptibility. More recently we have found certain sweet orange and grapefruit trees to be infected with cachexia disease without manifesting any outward symptoms. But when buds from such trees were placed on Orlando seedlings the inner bark of the Orlando rootstock showed the discoloration typical of cachexia disease. In Palestine a disease of Shamouti orange on sweet lime rootstock has been described under the name of xyloporosis and attributed to causes of a physiological nature (3). The same disease occurs in Brazil where it has been attributed to incompatibility between root and scion (2). Pickled specimens of xyloporosis from Brazil were found to present exactly the same symptoms in minutest detail as cachexia disease in Florida when Orlando tangelo is the rootstock and a symptomless carrier such as sweet orange or grapefruit is the scion.

Quite recently sweet orange and grapefruit on sweet lemon rootstock were found in Florida with exactly the same symptoms (xyloporosis or cachexia) as we had found previously in an experimental planting on Orlando and other susceptible rootstocks. I do not feel that this new discovery is anything to be alarmed about. It is just another instance of the cachexia disease that we have been working on for some years. We have no definite evidence that sweet orange or grapefruit trees on symptomless rootstocks are injured by cachexia disease. Although it is thought by many that unrecognized diseases such as this are responsible for the poor production and slow growth of certain strains of the old standard varieties of citrus. At any rate, there is certainly no object in using diseased buds of these varieties if there exists a means of screening them out. Fortunately, such a means of diagnosing cachexia disease does exist, based on the appearance of this discoloration of the inner bark in susceptible varieties.

Exocortis Disease

There is another disease that is either identical with or closely related to cachexia, and that is exocortis, or scaly butt disease. This disease is recognized mainly on **P. trifoliata** and some of the citranges (**P. trifoliata** hybrids). The scaling and sloughing of the bark that is typical of exocortis disease appears only on the rootstock. **P. trifoliata** rootstocks normally make a pronounced overgrowth at the bud union but in trees affected with exocortis disease this characteristic is depressed or absent, and growth is retarded. The scion variety, sweet orange, grapefruit, etc., as the case may be, shows no recognized bark symptoms, only severe stunting and greatly reduced productivity. In areas where trifoliata rootstock is used exocortis disease is responsible for poor production and the eventual death of many trees, and with the prospect of tristeza staring us in the face, **P. trifoliata** and the trifoliata hybrids that are tolerant to tristeza may become very desirable as substitutes for sour orange rootstocks.

Exocortis disease is another instance involving a symptomless carrier. Trees on Rough lemon or sour orange rootstock may harbor this disease but show no discernable symptoms. However, when buds taken from symptomless carriers are placed on trifoliata seedlings typical symptoms of exocortis appear below the union. At present no one knows to what extent this disease in its symptomless stage may affect fruit production but if we can conveniently eliminate exocortis disease at the same time that psorosis is being eliminated, at least we will be that much better prepared to meet the uncertainties of the future. So I suggest that in the course of certifying disease-free citrus trees, the presence or absence of exocortis disease be diagnosed by placing buds on 5 or 10 trifoliata seedlings.

Summary

To summarize the situation thus far, we in Florida are confronted with five recognized diseases of citrus each of which is exclusively or predominantly transmitted from tree to tree in budwood. Psorosis is the most important of the five and is responsible for a great many more unproductive trees than is generally recognized. We have at our disposal a means of eliminating this disease from our planting of young trees with every reason to believe that healthy trees will remain so indefinitely. This involves testing for disease symptoms under standardized conditions by specially trained personnel and the certification of those trees found to be disease-free. Certified trees will then serve as a source of clean buds for future propagation. California has had such a program since 1938 and Texas since 1948. Both have found that it is worth the cost. If the Florida citrus industry wants a program of certification against psorosis and its sister diseases, concave gum and blind pocket, it is my proposal that they bring the program up to date by including two other diseases that can be easily handled on the same basis, namely cachexia and exocortis. Furthermore, it is my suggestion that the by-laws of such a program be worded so as to provide sufficient flexibility that new diseases may be included at some future time if such action is believed advisable by the industry.

1. Childs, J. F. L. The cachexia disease of Oralndo tangelo. Plt. Dis. Reptr. 34(10):295-298, 1950.

2. Moreira, S. Xyloporosis. Hadar 11: 234-237, 1938.

3. Reichert, I., and J. Perlberger. Xyloporosis, the new citrus disease. Agri. Exp. Sta. Rehoboth, Palestine, Bull. 12, pp. 1-50. 1934.

Symposium Of Certification Of Disease-Free Nursery Stock

Importance of Bud-Transmitted Diseases of Citrus

Part II

By R. F. Suit

Dr. Childs has presented a discussion of the nature of the bud-transmitted diseases; psorosis, cachexia, and exocortis. In proceeding with the symposium it is desirable that some information be presented to give a clear picture as to the economic importance of these diseases in the citrus groves of Florida. During the past five years we have examined 443 groves in the state and have obtained data on the prevalence of many diseases. Although it has not been possible for us to make a complete survey of the groves for psorosis, with inspection for leaf symptoms on several flushes of growth, a sufficient number of groves have been examined for bark symptoms to give an indication of the situation. After all, the bark scaling stage is the economically important phase of the disease because that is the period when tree damage occurs.

Scaly Bark Prevalence

Based on the bark scaling symptom alone we have found that at the present time psorosis occurs in numerous groves. In our survey work a total of 37 groves were found in which the scaly bark phase of the disease occurred. The percentage of diseased trees varied from grove to grove. About half of the groves showed less than 10 percent of the trees with the disease. In one grove, 81.8 percent of the trees showed the scaly bark symptom. To date psorosis has been found in groves in 12 counties. Included in the list are the major citrus producing counties: Polk, Lake, Orange, Brevard, Indian River, Highlands, Hillsborough, St. Lucie, and Volusia. If a thorough survey was made psorosis would be found without question in every county in which citrus is grown commercially.

There are no varieties of oranges, grapefruit or tangerines that are known to be resistant to psorosis. In tangerines, the bark symptoms appear to be more superficial so that tangerine trees last longer with the disease present than orange or grapefruit trees.

Diseased Buds

As Dr. Childs has pointed out, psorosis is spread by diseased buds. Three examples selected at random will give you a picture of what may be expected from diseased budwood. A block of 374 grapefruit trees that was topworked to Hamlin about 1936 constitutes the first example. Fifteen years later 34.2 percent of the trees showed the scaly bark phase of psorosis. Thirty-nine trees (10.4 percent) were so severely diseased that the production was less than two boxes per tree and 24 trees (6.4 percent) had died. In the second instance 370 Hamlin trees were purchased from a nursery and set out in 1938. Ten years later 11.6 percent of the trees showed severe psorosis bark symptoms and were worthless. A third instance is really two examples in one and was reported by Stevens (5) in 1945. Buds from an old bearing grove of Parson Brown oranges were propagated and set out in grove form to constitute grove A. Buds from the 4-year-old grove A were in turn propagated and set out to form grove B. Five years after grove A was set out a survey was made of leaf symptoms, and it was found that 76.7 percent of the trees were diseased. Two years after grove B was set out it was found to have leaf symptoms on 74.7 percent of the trees. None of these trees showed bark symptoms and would have been diagnosed as healthy by the average grower. It is apparent that all these groves will have high operating costs. Many trees will be poor producers and replacements will be numerous. The net result will be a high cost of production per box of fruit.

In California and Texas Also

Citrus groves in California and Texas also have psorosis. In general the importance of the disease is better recognized in these areas than in Florida and more careful surveys on the basis of leaf symptoms have been made. In 1931, Hewitt, (3, 4,) reported on the prevalence of psorosis in 21 California groves. Five groves had less than 10 percent, 12 groves had from 10 to 40 percent, and 4 groves had over 40 percent of the trees diseased. In Texas four groves of Marsh grapefruit were surveyed for psorosis symptoms and from 19 to 82 percent of trees were found to be diseased. A survey of eight Texas Red grapefruit groves showed from 0 to 100 percent of the trees with psorosis. It is well known that Texas Red grapefruit budwood has been smuggled into Florida, and the consequences of this action will become apparent during the next fifteen years.

Reduction in Yield

One phase of psorosis economics is the reduction in yield. Hepner (2) reported information on this aspect for a small 8.15 acre grove in California. The number of trees with psorosis was equal to an acre of grove. This acre of diseased trees yielded 44 boxes of fruit, while the rest of the grove averaged exactly 13 times as much, or 572 boxes per acre. On the basis of prices and costs in 1939, this one acre of diseased trees reduced the net income from the 8.15 acre grove by 28 percent. If the trees had all been healthy a net return of $653.63 would have been obtained. As it was, a net return of $468.83 was received. In other words, the loss due to one acre of diseased trees was slightly more than it would have been if the grower had pulled out two acres from a completely healthy grove.

Susceptibility to Cold

Susceptibility to cold damage is

(Continued on page 16)

1. Presented at the Eighteenth Annual Citrus Growers Institute, August 27-31, 1951, Camp McQuarrie.
2. Plant Pathologist, Citrus Experiment Station, Lake Alfred, Florida.

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A GREAT CITRUS MEETING

The recent meeting of the Citrus Growers Institute at Camp McQuarrie, the eighteenth annual meeting of that organization, was attended by several hundred citrus growers and the program rendered warranted a much larger attendance. Subjects of the utmost importance to citrus growers were covered by research workers, field men and others intimately associated with the industry. Workers from the University of Florida, the Experiment Stations, the U. S. Department of Agriculture, the Florida Inspection Service, and just everyday citrus growers, were there in force and took active part in the procedings. Among the highlights of the meeting may be mentioned the following:

"A Symposium on the Certification of Disease-Free Nursery Stock," which was covered by research workers from the United States Department of Agriculture, the Citrus Experiment Station, the Florida Inspection Department, nurserymen and growers. Two of the papers presented in this Symposium by research workers will be found elsewhere in this issue of The Citrus Industry. Papers by the head of the Florida Plant Board, a Florida nurseryman and a Florida grower will be published in the October issue of this magazine. They are well worth the study and careful consideration of every citrus grower.

"Results Revealed by Production Records on Irrigated and Non-Irrigated Groves," by Zach Savage, Associate Agricultural Economist, Florida Experiment Station, brought out many new facts and pointed the way to further studies by growers who use or contemplate using irrigation in their groves.

"Present Status and Trends in Citrus Varieties," by Dr. L. W. Zeigler, Professor of Citrus Culture, College of Agriculture, gave a clear picture of present trends.

"Present Status of Citrus Insects," by Dr. R. M. Pratt, Entomologist-Pathologist, Citrus Experiment Station, discussed the present status of citrus insect pests and what is being done to combat them.

An unscheduled talk by Arthur C. Brown, State Plant Board Commissioner, brought to light a new disease which affects Valencia orange trees budded on sweet lemon stock, and which shows the typical symptoms of xyloporosis, which has been found in a number of groves in the state. Fortunately the disease is found only on Valencia oranges budded on the sweet lemon stock, and the groves of this character are very scarce, which probably is the reason that the disease has not been previously discovered by the lay grower.

Pointing out that while there will undoubtedly be a great increase in population in the next few years, Dr. H. G. Hamilton, head of the Department of Agricultural Economics at the University of Florida, warned growers not to count too heavily on this bringing about a heavy increase in the consumption of citrus fruits, since the population increase will be accompanied by a still heavier increase in taxes, thus cutting down the "take home" revenue of the average family.

Dr. I. W. Wander, Soils Chemist at the Citrus Experiment Station, told how leeching losses are determined by the composition of underground water.

The work of the Florida Citrus Commission was described by W. F. Robinson, chairman of the Commission, while the Florida Citrus Mutual, its past achievements, present status and future plans were presented by A. V. Saurman, president of the super-cooperative organization.

It is in just such meetings as that at Camp McQuarrie that the citrus growers of the state get in closer touch with the vital problems facing the industry. They get not alone the views of research workers and public officials, but they come face to face with other growers who have been confronted with, and probably solved, the very problems which they are now trying to solve. Florida citrus growers could profit by a greater number of such institutes throughout the state.

"OFF WITH THE OLD; ON WITH THE NEW"

Florida is just closing one of the longest fresh fruit shipping seasons in its history, a season which, while it lacked much of showing spectacular results of the year preceeding, did result in a profitable operation for most growers.

And barely are we off with the 1950-51 shipping season than we are faced with the opening of a new season and with a crop which, barring storm or other misfortune, promises to eclipse all previous years in the matter of production. Trees are heavily laden with fast maturing fruit which experts say is giving every promise of being of excellent quality.

While it would be too much to expect the phenominal prices of 1950 to prevail this season, growers believe that with proper marketing control by Mutual and proper enforcement of the citrus code by the Citrus Commission, another profitable season is in the offing. Certainly at the moment everything seems to indicate that there will be no dearth of good fruit for all elements of the industry — fresh fruit shippers, canners, concentrators and by-products producers. Wisely controlled marketing would seem to be the main problem facing the industry.

Dr. Harold Mowry Goes To Costa Rica

Dr. Harold Mowry, a national authority on sub-tropical horticulture, left August 17, as a representative of the U. S. Department of Agriculture to make a study of agricultural problems and needs in Costa Rica. He will give special study to opportunities for agricultural research and service.

The assignment is made at the request of the Govenment of Costa Rica and in cooperation with the Technical Cooperation Administration, Department of State.

Dr. Mowry, previous to his retirement in January, 1950, was director of the Florida Agricultural Experiment Station which included a main station and 13 branches in various major agricultural regions of the State. In the 10 major lines of research that he directed, considerable emphasis was given to work on citrus fruits, vegetables, and livestock. A recognized accomp'ishment during Dr. Mowry's association with the program, was the findings on "minor elements" of the soil—elusive elements such as zinc, cooper, manganese, magnesium, boron, cobalt, and phosphorus, to name a few—the presence or absence of which can spell the difference between success or failure in raising crops and livestock.

A native of Valley Falls, Kans., Dr. Mowry received his academic degrees in agriculture from the University of Florida. He has been active in State and local affairs, including membership in the Florida State Development Board; director, Gainesville Chamber of Commerce; chairman, Agricultural Advisory Division of Florida State Defense Council; and past president, Gainesville Kiwanis Club.

TUNG NUTS INCREASED IN SOUTHERN STATES

The 1951 production of tung nuts in the Southern States is forecast as 59,400 tons, 68 percent above the 1950 revised production of 35,300 tons but 32 percent below the 1949 production of 87,900 tons. The freezes in late November and mid-March reduced the 1951 crop.

Prospects for tung nuts are excellent in Florida except in groves located in the extreme western part of the State. A few trees in this area were killed by the November freeze but for the most part no serious tree losses were reported. In Alabama, the hard freeze in November reduced the 1951 crop. Some trees were completely killed but the greatest damage was to fruit buds. Some further frost damage occurred in early April during blooming time. The Mississippi crop will be short, though about double the small 1950 crop. The crop was damaged by the March 1951 cold spell. In southwest Mississippi, the 1951 crop will be about the same size as the small crop of a year ago. The loss was less severe east of the Pearl River and in this area the crop will be fair. The Louisiana crop will be very short.

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RESULTS REVEALED BY PRODUCTION RECORDS ON IRRIGATED AND NONIRRIGATED GROVES

(Continued from page 5)

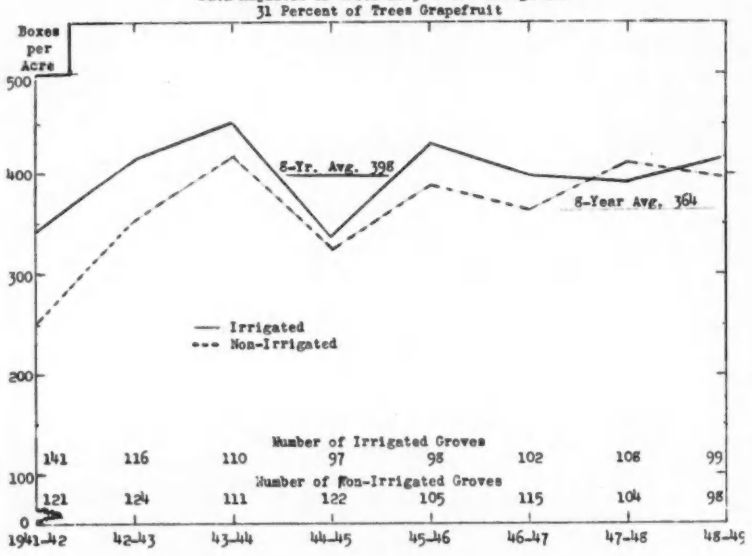
doing the grower would realize a greater profit. There might be one exception to this in case the grower desired to lower his income tax by increased expenses.

Measuring Results

Results obtained from groves vary with a number of conditions. Some of these factors are age of tree, proportion of grove grapefruit, variety, soil, fertilizer, spray, dust, rootstock, and setting distances. Growers of this study varied widely in these and other things. However, the irrigated group as a whole did not differ widely in most of these factors from the nonirrigated group. Two of these items did vary considerably between the two groups for the same season and between seasons. These items were age of tree and the proportion of the trees that were grapefruit. From 1941 to 1949 the average age of the irrigated grove was from 2 to 4 years older within the same season than the nonirrigated group. Also, there was a variation of 8 years in average age between seasons. The proportion of the trees that were grapefruit was from 1 to 15 percentage points lower in the irrigated group for the same season. The proportion of grapefruit as well as other things affected the price received for fruit, varying up to 28 cents per box higher per season for the irrigated group.

An attempt was made to eliminate the differences between the groups due to age of tree, proportion of trees grapefruit, and price of fruit. This was done for better and more direct comparisons. Data for both groups were adjusted to a tree age of 30 years, proportion of trees grapefruit to 31 percent grapefruit, and the price received for fruit to the average for the season.

CHART 1. BOXES HARVESTED PER ACRE
IRRIGATED AND NON-IRRIGATED GROVES, 1941-49
Data Adjusted to Trees at 30 Years of Age and 31 Percent of Trees Grapefruit



Source: Florida Agricultural Extension Service, Gainesville.

Boxes Harvested

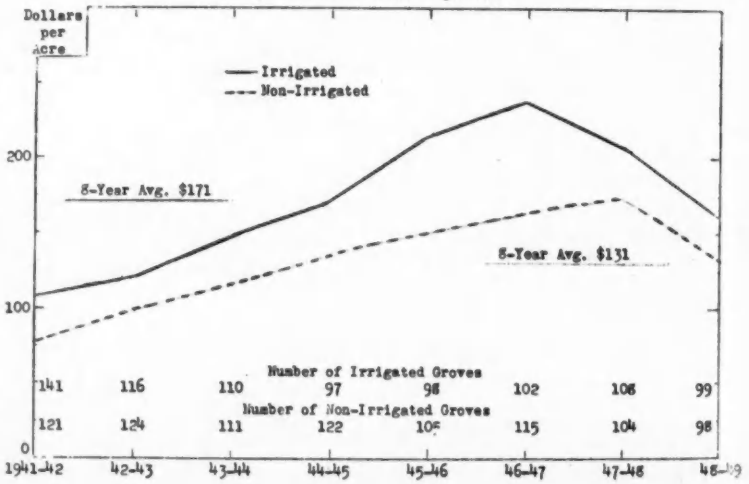
On the basis of trees at 30 years of age and 31 percent grapefruit there was only one season of the 8 shown in Chart 1 when nonirrigated groves yielded more fruit than the irrigated. That was in the 1947-48 season. It was not indicated on the Chart but the yield for the 1949-50 season was 75 boxes higher in the nonirrigated group. It will be noted from Chart 1 that there was a tendency toward a narrowing of the spread in yields between the two groups as the period progressed. The average for the 8 seasons was 34 boxes more in the irrigated, but if 1949-50 is included, the spread for the 9 seasons is narrowed to 21 boxes in favor of the irrigated.

Operating Cost

Operating cost includes all cash costs, unpaid labor, and 6 percent interest on the investment in equipment. Such costs were high in most of the seasons of this period. Chart 2. Operating cost per acre was higher each season and averaged $40 more on the irrigated groves. An average of $15 per acre was spent for irrigation. To what extent irrigation increased other operations was not determined. That is, the extent, if any, of increases in mowing, disking,

(Continued on page 17)

CHART 2. OPERATING COSTS PER ACRE
IRRIGATED AND NON-IRRIGATED GROVES, 1941-49
Data Adjusted to Trees at 30 Years of Age and 31 Percent of Trees Grapefruit



Source: Florida Agricultural Extension Service, Gainesville.

Saurman Tells Citrus Institute Of Florida Mutual's Progress

*Address By
A. V. SAURMAN, GEN. MGR.,
FLORIDA CITRUS MUTUAL
— At —
CITRUS GROWERS INSTITUTE
CAMP McQUARRIE, AUG. 29, 1951

The citrus growers who come to Camp McQuarrie for this Institute are here for one primary purpose. They want to learn all they can about the citrus industry and to understand industry problems. On behalf of Florida Citrus Mutual I am glad of this opportunity to say a few things that I hope will contribute to better understanding of some of these problems.

Mutual is a growers organization but it is also an industry organization. It is one of the first serious attempts in agriculture to bring the producer, the handler, and the markets into closer cooperation and understanding. The effects of two seasons operations of Mutual in this field speak for themselves.

Any appraisal of results must, of course, be made in the light of a full seasonal operations and cannot, in all fairness, be judged by any short part of a season. In looking back over these two years the most outstanding feature of the industry, with Mutual a part of it, has been the stability of our markets. The wide fluctuations of raw fruit prices, of F. O. B. prices, and of auction prices, have been greatly reduced. Producers have come closer to receiving their full share of the market value of their fruit than in other years. In fact, they may have, in some cases, received more than they should, but on the average I believe growers could not have asked for a better deal than they have had during these two seasons.

However, we must realize that many growers and many handlers have had their troubles during the last eight or ten weeks of the season. There has been a great deal of misunderstanding as to what happened price-wise during this period. Therefore, I want to take a few moments to discuss these difficulties to see if we can understand them.

These troubles did not come about by actions of Mutual in establishing floor prices, nor by the actions of any one part of the industry. If there were actions taken that were or should be considered as mistakes, they were mistakes of the industry. Certainly they were justifiable errors in the light of what we now know. The price and distribution troubles were caused by a complete misappraisal of our marketing problem. I believe everyone of you will agree, had we known the Florida crop would be more than 7-million boxes of oranges and 2 million boxes of grapefruit in excess of what we expected as late as March 1st, that our ideas of how to market the crop and the price it should bring would have been quite different. In addition to this extra production, few in the industry realized until almost the close of the season that the nearly ten per cent increase in the juice yield of processed oranges would add some 3½ million extra cases of canned and concentrated products to the peak. Furthermore, the addition of 4-million more boxes to the California Valencia estimate, after March 1st, added to the staggering total of extra volume that the Florida industry completely failed to consider in its marketing plans. Just stop to think, what our ideas might have been if on March 1st we had foreseen an extra volume equivalent to 17-million boxes of citrus from all areas. In looking back on the season, I believe we are most fortunate that as much money came back to the growers as did. Certainly the returns were far greater than the facts, as they turned out to be, would have justified.

(Continued on page 18)

*Read by Robert C. White, Manager, Statistical and Economical Department, Florida Citrus Mutual.

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Reports Of Our Field Men . . .

WEST CENTRAL FLORIDA
Joseph E. Mickler

In Citrus, Hernando, Sumter, and Marion Counties, the pastures are now feeling the effects of belated rains. Pensacola Bahia combining is coming to a close after a somewhat peculiar season. Interest in Argentine Bahia is quickening despite conservative reports. Some interests are planning to plant extensive acreage in this comparatively new grass, in the full belief that it will far surpass Pensacola Bahia.

Groves in this section reflect the general trend of other sections throughout the state, that of bumper crops. It is a rule that tangerines in this section command top prices, and from the indications of groves here, they once more will enjoy a good season.

Both pasture development and grove interests show a much stronger interest in the economic aspects of a fuller fertilization program. Indications are that the coming season will see more developments in both fields.

PINELLAS COUNTY
T. D. Watson

The invasion of rust mites has been general over this territory of late, and most growers are making use of a sulphur spray to control the situation.

As usual at this season of the year little work, aside from spraying, is being done in the groves, and many of the growers have been taking well deserved vacations.

The crop still appears to be heavy and in most groves new growth is showing up very favorably.

PASCO AND EAST HILLSBOROUGH COUNTIES
E. A. McCartney

Good rains as a rule in this territory have brought out new growth on the citrus trees and a good crop of uniform bloom is developing in fine shape. This is quite different from last season when we had three to five different blooms which caused a lot of trouble in moving the crop.

Choppers have started already on the cover crop in some groves. Oil spraying is over, groves are being pruned and put in shape. There is considerable uncertainity among the growers as to the price this coming season. They are very much concerned. It is one of the main topics of conversation. The crop is generally good, some spotty light groves in this section. Vegetable growers ended up with a little money, but as happens every year some had bad luck and just about broke even.

Cattlemen are still developing new pastures. This is one agricultural activity that is definitely going ahead in a big way. Fertilization is playing a big part in their success.

SOUTHWEST FLORIDA
Eaves Allison

The citrus crop is progressing satisfactorily since July rains started and tree growth has been good over this area. Moisture is sufficient at this time, August 15th, with a prospect for more in the immediate future. So far our total rainfall in this section has been below normal — which might point to a wet fall — unless the present rains continue on.

Vegetable land is being readied, with seed beds now being planted to first seedlings. Glad growers in Sun City-Bradenton area are making their first planting and those further south preparing lands for a little later planting.

The first two weeks in August here have been our hottest this year.

SOUTH POLK, HIGHLANDS, HARDEE AND DE SOTO COUNTIES
C. R. Wingfield

The general condition of the citrus groves in this section appears to be very good. The local showers have been beneficial in keeping the trees in a thrifty growing state, which in turn is increasing the size of the fruit. In some localities however, they are in need of moisture and if they do not have rains soon they will have to start irrigation.

There appears to be a fairly normal crop of early and midseason oranges with a possible lighter crop of Valencias. Those trees having a light crop have fruit that is large for this time in the season.

With the fertilizer period behind them the growers have turned their attention to scale and rust mite control. Both of these insects have been very active and a close watch has been necessary. Do not under estimate rust mite damage at this season for it can retard size.

Where cover crops have sufficiently seeded it will be well to start chopping or discing. Many have already started.

WEST CENTRAL FLORIDA
V. E. Bourland

Rains in this section have been kind of scattered for the last ten days, some spots grass is in a wilt, and young trees are having to be watered. Rust mite are thriving in most groves but so far growers have done a very good job in keeping fruit bright. Fruit is sizing up nicely, cover crops are good, and most of it being chopped. Growers should spot where surface water stands, and cut and clean their ditches to take off surplus water from September gales.

Some of the truck land is being prepared for fall crops. Most all improved pasture grasses are looking good.

POLK COUNTY
J. T. Griffiths, District Mgr.,
J. K. Engor, Field Representative

Citrus production work is generally at a low level throughout Polk County. The summer scalicide spray has been applied and most growers are concerned with the maintenance of rust mite free fruit.

In general, rust mites have increased materially throughout the area in late July and August. Almost all groves have required the use of sulphur since the spray for scale control. In a few cases there have been groves where satisfactory red scale control was not obtained in the June spray.

In most of these cases, a parathion-sulphur spray has been applied. In general, scale control has been quite satisfactory and it is anticipated that scale control will not be a complicating factor in most groves during the fall of this year. Dolomite and High-Calcium Limestone are being applied by many growers at this time.

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Uncle Bill Says:

Ever since we can remember, and that's quite a hunk of years, a lot of us citrus growers has been worryin' fer fear we was producin' more citrus than the public could consume. It must be admitted that they is a heap of fruit raised in Florida, and that they's a heap of young groves that'll be comin' into bearin' right along, but we still maintain that with a bunch of as smart business folks as Florida growers are there'll still be plenty of market for good quality fruit.

Thirty years ago we first heard this plaint, about our production gettin' too big . . . but a little while after that we started in a small way to merchandise our crops and to create a demand for good fruit all over the country.

Then a few years ago when it looked like the nurserymen would have to shut down, 'cause we were raisin' too much fruit, along come the outlet for a big hunk of our crops for canning and juice purposes . . . then here lately we found another big outlet for our fruit with the folks who was makin' concentrate. The hulls is now producin' some of the finest cattle food in the world, and other by-products is keepin' our citrus crops valuable.

And all this time research workers at our Experiment Stations, and some private research workers is still seekin' to find new products which can be made from our citrus . . . and findin' a lot of 'em too.

So with all this big crop business we maintain that we haven't reached what the experts call "the saturation point" in production. Of course it may be that until such time as some of these researchers find an outlet that will require a big chunk of our crop we'll have to be satisfied with less than $5-a-box prices, but fer our money there'll be more and more people using citrus in its varied forms with each passin' year . . . and when they find out just how palatable good Florida citrus fruit and citrus juices are the per capita consumption will continue to climb along with the increase in production.

SYMPOSIUM ON CERTIFICATION OF DISEASE---FREE NURSERY STOCK

Part II

IMPORTANCE OF BUD-TRANSMITTED DISEASE OF CITRUS[1]

(Continued from page 9)

an additional adverse effect of psorosis on citrus trees. Mr. Carl Waibel (6) of the Texas Department of Agriculture has furnished us some interesting information on the effect of the severe 1950-51 freeze on psorosis-infected red grapefruit. In a block of 28 trees under observation for psorosis for four years, four trees showed leaf symptoms of psorosis. These four trees were killed by cold; the remainder survived. In a second block of 60 trees also under observation for four years, 12 trees showed bark symptoms and 20 more showed leaf symptoms. Eleven of the 12 trees with bark symptoms were killed and 18 of the 20 trees with only leaf symptoms were killed. Three of the diseased trees and all of the healthy trees survived. In a third block of 32 trees under observation for two years, 6 trees showed bark symptoms and 5 more showed leaf symptoms. All diseased trees were killed by cold. All healthy trees survived. Lastly, a block of 30 trees under observation two years showed seven trees with leaf symptoms; none showed bark symptoms. The seven diseased trees died and the remaining healthy trees survived. I don't think anyone would claim that all of the trees killed by the 1950-51 freeze in Texas were infected with psorosis, because that it not true. However, these data certainly show that psorosis-infected trees are more susceptible to cold injury than healthy trees.

Five Ways to Lose

In observing the over-all effect of psorosis, there are five ways in which this disease causes economic loss to the grower. First, trees diseased with psorosis are not good insurance risks nor good collateral for a loan; their productive life expectancy is short. Second, a tree out of production due to disease costs the grower as much as two missing trees. Third, a tree infected with psorosis is more susceptible to death from freezing, even though it may still be a good producer. The owner will frequently want to keep a diseased tree for another year or two in hope that he can do something to cure it, so the cost goes on. Fourth, eventually the diseased tree is removed and replaced with a young tree which costs money. That expense and the cost of growing the young tree to bearing age should be charged against the diseased tree. Fifth, a grove with psorosis will contain trees of various ages due to replanting, which increases the cost of maintaining the grove when fertilizing and picking fruit. So you see, psorosis can really increase grove costs.

Disease of Young Trees

Another bud-transmitted disease of citrus is more rapid in its effect and might be termed a disease of young trees in contrast to psorosis which is a disease of trees 10 to 15 years of age. This disease has been named cachexia by Dr. Childs and is commonly known as the Orlando tangelo disease (1). If the Orlando tangelo tree lives to be 5 or 6 years old without showing symptoms it is usually disease-free and makes a good tree. Cachexia may cause the death of trees as young as 2 to 5 years old. In our survey work we have observed this disease in 7 young groves of Orlando tangelo in Lake, Orange, Manatee, Highlands, and Sarasota counties. The percentage of diseased trees varied from less than 1 percent, to 60 percent in the different groves. Most of these diseased trees never came into good production and in many cases a high percentage of replacements were needed to make a complete planting. Experimental results indicate that cachexia can be eliminated by using buds from healthy trees.

Recently xyloporosis has been found in a number of locations in the state on sweet lemon rootstock. Dr. Childs has evidence indicating that this is the same disease that he has described under the name of Orlando tangelo disease or cachexia (1). In Palestine and other areas of the world where this disease is prevalent it has caused severe losses to trees on sweet lime root. However, we can expect xyloporosis to be controlled through the use of certified disease-free budwood.

Other Diseases

Other virus diseases such as tristeza, quick decline, blind pocket, concave gum disease, stubborn disease, and exocortis can be transmitted by the use of buds from diseased trees. The control of such diseases, the rate at which they might spread, and the prevention of the introduction into the state of some of the new diseases would be aided by a program of budwood certification and registration. Certification would go a long way to discourage the smuggling of out-of-state budwood into Florida by emphasizing the importance of budwood of known disease-free parentage.

Budwood Will Control

The use of certified budwood will control the various diseases so transmitted. However, if any of the virus diseases present in Florida or that might be introduced into the state could also be transmitted by insects present in the state, the use of disease-free budwood would not necessarily control that disease. This is one factor that should be given consideration in a certification program. As far as is known, psorosis and cachexia are not insect transmitted.

There are two principal uses for new trees: Planting new groves and replanting trees in established groves. In either case the trees used should be disease-free. This is particularly true of replacements in an established grove. Some of the reasons for the replacement of trees are the following diseases or conditions: 1, spreading decline; 2, foot rot; 3, root rot; 4, water damage; 5, psorosis; 6, lightning injury; and 7, cachexia. In this list are the two most important bud-transmitted diseases of citrus which we have discussed here. If the various forms of psorosis and of cachexia were eliminated by the use of proper budwood a part of replacement problems in established groves would be solved, while if diseased budwood was used indiscriminately it would not be long before these diseases would be a primary cause for tree replacement.

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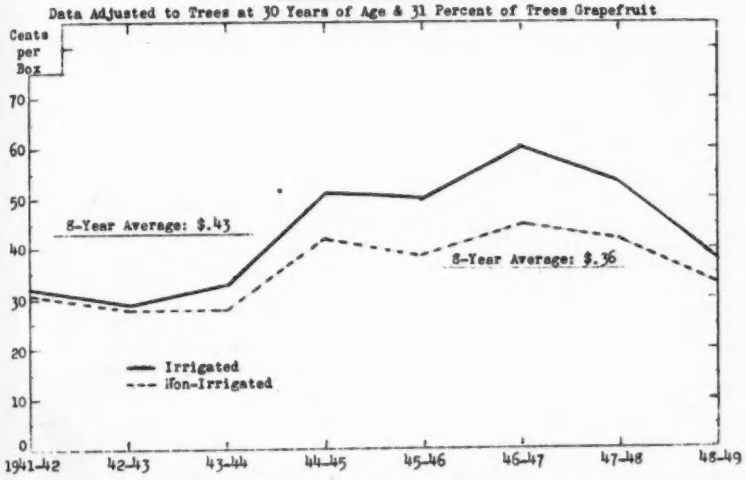
RESULTS REVEALED BY PRODUCTION RECORDS ON IRRIGATED AND NONIRRIGATED GROVES

(Continued from page 12)

hoeing, or any other operation due to irrigation was not determined. The fact remains, however, that most of the difference of $25 per acre not attributable directly to irrigation cost was in other labor, power, and equipment cost and may have been due, at least in part, to extra operations made necessary by irrigation. This added cost becomes increasingly important as fruit prices decline. For example, in 1947-48 when fruit was 48 cents the irrigated groves lacked $19 of paying operating cost, while nonirrigated groves returned $23 above operating cost.

Operating cost per box was from 1 to 15 cents higher each season on the irrigated groves and averaged 7 cents higher. Chart 3.

CHART 3. OPERATING COSTS PER BOX
IRRIGATED AND NON-IRRIGATED GROVES, 1941-49
Data Adjusted to Trees at 30 Years of Age & 31 Percent of Trees Grapefruit



Number of Irrigated Groves							
141	116	110	97	98	102	108	99
Number of Non-Irrigated Groves							
121	124	111	122	105	115	104	98

Source: Florida Agricultural Extension Service, Gainesville.

Returns Above Operating Cost

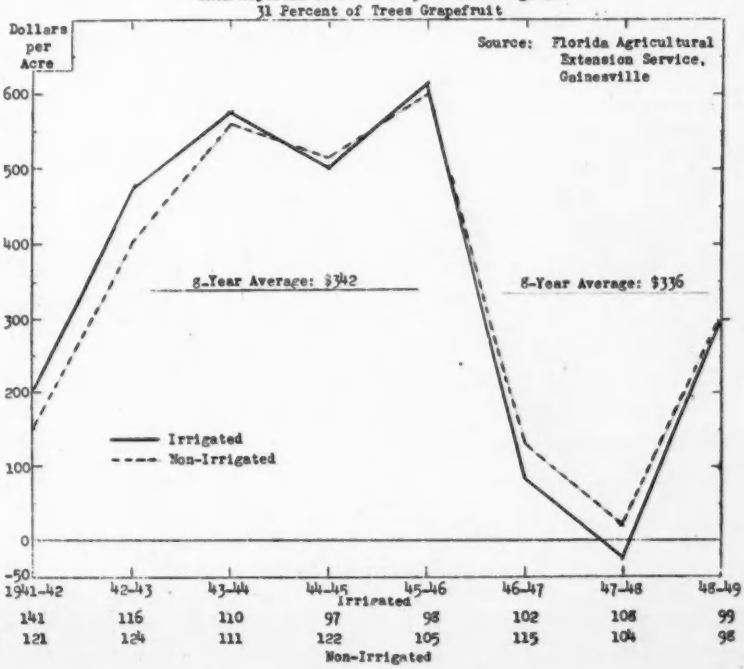
The amount of the returns from fruit that the grower had left after paying operating cost was termed returns above operating cost. This was the amount left for interest on the investment in land and trees, for owner supervision, and for profit.

There were half of these seasons when returns above operating cost were higher on the nonirrigated groves. Chart 4. These seasons were 4 of the last 5 of the period. The average for the 8 seasons was $6 per acre more on the irrigated groves. However, in the following season of 1949-50 the spread was $169 per acre in favor of the nonirrigated groves. The average for the 9 seasons was $14 per acre more in the nonirrigated.

Returns above operating cost per box were 1 to 15 cents more each season on the nonirrigated groves, and averaged 7 cents more.

Other Indicators

CHART 4. RETURNS ABOVE OPERATING COSTS PER ACRE
IRRIGATED AND NON-IRRIGATED GROVES, 1941-49
Data Adjusted to Trees at 30 Years of Age and
31 Percent of Trees Grapefruit



Irrigated							
141	116	110	97	98	102	108	99
Non-Irrigated							
121	124	111	122	105	115	104	98

It was thought that perhaps the growers who owned their own irrigation equipment through better timing of the operation, not being rushed for use of equipment on other groves, more personal interest and pride, and other reasons, that possibly this group might have had better results from irrigation than those renting equipment. However, the results showed the rented equipment group had a slight advantage.

Another idea was that possibly the age of the tree had some bearing on the results from irrigation but it did not appear to have any.

A sort was made of these data on the amount of money spent per acre from fertilizer materials. Over this period and including the 4 seasons of 1937-41, the groves having under $50 per acre spent for fertilizer materials there were slight advantages in yield and net returns on the irrigated groves. Groves that had less than $30 spent for fertilizer showed the greatest advantages from irrigation. Perhaps this indicates more favorable results from irrigation on groves not so well fertilized or under fertilized. At least, this was true if the amount of money spent for fertilizer materials was any indication as to whether the groves were well fed. However, this does not mean that the money spent for irrigation on

these under-fertilized groves returned as much as the same amount would have if spent for additional fertilizer.

These data are for the 9 seasons of 1941-50. Our records on irrigation date back to the 1932-33 season. Data for this earlier period of 1932-41 showed essentially the same results as the later period.

As has already been stated, it is hoped that this presentation will stimulate growers to make some experiments of their own concerning this matter of irrigation. Most irrigated groves have a few trees somewhere that are a bit difficult to reach with water. If not, it would be a simple matter to omit 12, 16, or 24 trees in one corner. These trees need not be the best in the grove nor should they be the poorest. The only difference in treatment and management between these trees and the remainder of the grove should be the application of water. The fruit from the nonirrigated trees should be checked for quantity and quality for comparison with the remainder of the grove. This should be done each season on the same trees from now on, and every irrigated grove should be so tested.

There are groves, perhaps a substantial proportion of them, on which irrigation has been paying well. No doubt there are other groves on which it would pay if practiced. It is difficult on some groves to get a full regular bloom and fruit set without irrigation. Other groves have their own peculiarities that irrigation might benefit. But irrigation should not be practiced on groves where it does not pay. Every effort should be made to test each grove as to the extent irrigation pays on it, and if irrigation does pay on the particular grove, the operation should be performed for best and most efficient results.

SAURMAN TELLS CITRUS INSTITUTE OF FLORIDA MUTUAL PROGRESS

(Continued from page 13)

What all of this points up, in my mind, is the greater than ever need for the industry — growers, handlers and marketing agencies — to know the facts, work together and plan to do the job necessary to market our production at the highest possible level.

I think that price-wise our experience emphasizes what I have said over and over again, that you can't make prices just by wanting them and by naming them. Prices cannot be controlled rigidly unless some kind of monopoly exists that will tailor supply to demand at a given price. As far as the industry is concerned, in its use of the powers of Florida Citrus Mutual, I feel certain that the only price floors that can be maintained and create basic stability are prices that will assure the marketing of ALL of the crop. And to do even this, at cost of production plus a reasonable profit, provided the economics of the marketing season will justify moving the entire production at or above this figure, is as far as the industry ought to expect Mutual to go in the price control field. Supply and demand can have free play above the figure. Should conditions of supply and demand indicate fruit values below such a production cost figure, then the industry should give serious consideration to some kind of surplus control that will remove the excess that prevents achieving a satisfactory base price.

The positive approach to this problem is, of course, development of new markets and outlets so that demand can be kept ahead of supply. That is the reason our industry advertising, promotion, and research is so vital. The present interest in citrus cracking the so-called "beverage fieid" is an effort along the right track to expand consumption. This is a much better approach than to resort to surplus elimination. We don't like to destroy anything we produce, but as citrus growers we may have to think about such eventualities. We can't slow up production with a tree crop like we could with an annual crop. If the production of annual crops can't be sold profitably, the farmer doesn't

(Continued on inside back cover)

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SAURMAN TELLS CITRUS INSTITUTE OF FLORIDA MUTUAL PROGRESS

(Continued from page 18)

have to plant as much another year. He can adjust to meet conditions comparatively rapidly. Not so with the growers of tree crops. There is an 8 to 10 year time lag between planting a tree crop and the start of commercial harvesting. So we should be giving serious thought to some means of fitting supply to demand in the event of emergencies over which we as producers can have no control and which may result in serious losses.

There are so many facets to the citrus industry, so many places where Mutual affects and influences the results, that it would take far more time than allotted to me to cover even the most important ones.

In concluding I want to make it very clear that Mutual, conceived as an industry organization controlled by growers, has no serious argument with any part of the industry. Mutual growers use every kind of facility we have and Mutual recognizes them all, but it does say to all of them: — "We want your help, your support and your cooperation. You shall have all of these from us." We full well know that all parts of this industry that serve the grower must have the incentive of a fair profit, just as the grower must have such an incentive. We also know that accurate information to growers, handlers and the markets can do a great deal to make the industry profitable for all of us.

Again, on behalf of our growers, I bespeak the full cooperation and support of all of the handlers. Help us do the job, help us continue to make Florida citrus the most satisfactory and most important part of Florida's economy.

CITRUS FRUIT STORY FOR CHILDREN IN BRAILLE

A children's story, "Orange Blossom Time," by Ruby Leach Carson, has been embossed in Braille by the American Printing House for the Blind, in Louisville, Kentucky. The story represents the State of Florida in "Stories from the South," one of three books of short stories in the regional series, "Children of the U.S.A.", published by Silver Burdett Company, textbook publishers, and compiled by Marion Beldon Cook. The other books in the grouping are . "Stories from the East and North," and "Stories from the West."

TEXAS MAGAZINE CHANGES HANDS

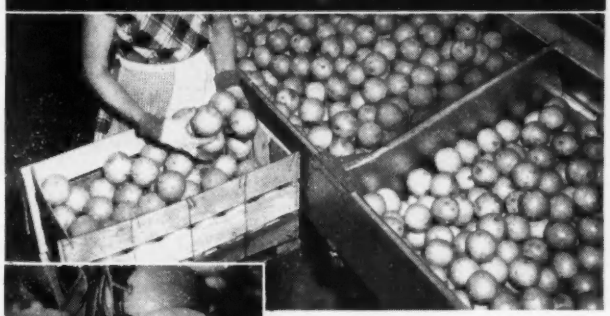
Texas Farming and Citriculture, a magazine published at Harlingen, Texas, which has served the interests of Texas citrus and vegetable growers of the Lower Rio Grande Valley for the past 27 years, almost since the Valley was transformed from a wilderness to a progressive fruit and vegetable section, has been sold. Harry Foehner, a longtime resident of the Valley and well known writer on agricultural topics, has purchased the magazine from E. C. Watson.

NEW CAN DEPOT WILL AID CITRUS GROWERS

To further expedite and enlarge its service to citrus canners of the area, the American Can Company has arranged to establish a can warehouse operation at Auburndale, Florida.

The warehouse, containing 53,000 square feet of floor space—sufficient to store several million cans at a time—will be leased from Barton H. Smith, of Tampa. Construction of the building is being carried out by the Paul Smith Construction Co., also of Tampa.

Key to Larger Yields



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